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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/424,660	01/27/1999	WOLFGANG BECKER	PM265122	8310

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EXAMINER	
BAREFORD, KATHERINE A	

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/424,660	BECKER ET AL.	
	Examiner	Art Unit	
	Katherine A. Bareford	1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- *If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.*
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *30 and 31* is/are allowed.

6)☒ Claim(s) *14,18-20,24,25 and 27-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers Claims 1-13, 15-17, 21-23, and 26 are cancelled

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The amendment of Sept. 17, 2003 has been received and entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 14, 20, 24 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 706 178 A1 (hereinafter '178) in view of Japan 05-002777 (hereinafter '777).

'178 teaches a method and apparatus for applying a layer of viscous fluid onto a substrate. Column 11, line 40 through column 12, line 20 and figures 3A-3C. The viscous fluid (resin bonding material) is provided on a dosing arm (nozzle) positioned over the substrate. Column 11, line 40 through column 12, line 20 and figures 3A-3C. A layer is formed on the substrate by dosing the substrate with fluid from the dosing arm. Column 11, line 40 through column 12, line 20 and figures 3A-3C. The substrate is rotated with a rotary drive. Column 11, lines 40-

45and figures 3A-3C. The amount of fluid and rotation of the substrate is controlled. Column 11, lines 40-45. The fluid is bonding material for bonding a second substrate to the first substrate. Column 11, lines 40-55. The second substrate is positioned over the layer of viscous fluid formed on the first substrate. Column 11, line 40 through column 12, line 20 and figures 3A-3C. Then the connected substrates are spun together to spin off excess fluid. Column 11, line 40 through column 12, line 20 and figures 3A-3C.

Claim 20: the process makes optical storage disks. Column 5, lines 40-50.

Claim 24: the apparatus for applying the layer includes a dosing arm and a rotary drive that rotates the substrate. Column 11, lines 40-45 and figure 3A. A means to connect the first and second substrates is provided. Column 11, line 40 through column 12, line 20 and figures 3A-3C. A means to rotate the connected substrates is provided. Column 11, line 40 through column 12, line 20 and figures 3A-3C.

'178 teaches all the features of these claims except the controller system for controlling the thickness of the viscous fluid on the substrate, the pump, and the plate for holding the substrate.

However, '777 teaches a method and apparatus for applying a layer of a viscous fluid onto a planar substrate. Abstract and figure. The viscous fluid (resist) is provided to a dosing arm (see nozzle 4) positioned over a substrate. Abstract and figure. A layer is formed on the substrate by dosing the substrate with fluid from the dosing arm. Abstract and figure. The substrate is rotated by a rotary drive (i.e. the computer controlled rotating for the coater system would be provided by a drive mechanism of some sort). Abstract and figure. A thickness of the layer

formed on the substrate is controlled by controlling the rotary speed of the rotary drive at a speed based in response to the temperature of the substrate (measured by sensor 7) and the temperature of the viscous fluid (measured by sensor 6). Abstract and figure and paragraph [0007] of Detailed Description translation. The apparatus for applying the fluid includes a dosing arm (nozzle 4) and a plate that supports the substrate (see the area marked 2 on the figure). Abstract and figure. A computer controller is provided that controls a thickness of the layer formed on the substrate by controlling the rotary speed of the rotary drive at a speed based in response to the temperature of the substrate (measured by sensor 7) and the temperature of the viscous fluid (measured by sensor 6). Abstract and figure and paragraph [0007] of the Detailed Description translation.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '178 to use the control system of '777 to control the thickness of the layer on the first substrate with an expectation of desirably even coating results, because both references teach spin coating of a substrate with '178 teaching a desirable range of amounts of coating and rotation speeds of the substrate to be used for providing a bonding coating, and '777 teaching that when spin coating it is desirable to monitor coating conditions, including substrate and fluid temperatures, and to use these monitored coating conditions to provide an optimum coating thickness by controlling the rotational speed of the substrate. It would further have been obvious to one of ordinary skill in the art at the time the invention was made to modify '178 in view of '777 to provide a dosing pump to supply the fluid to the dosing arm with an expectation of desirable coating results, because '178 in view of '777 teaches that fluid is supplied to a dosing

arm during the process, and it is the Examiner's position that a dosing pump is a conventional method for supplying fluid to a dosing arm in the art of spin coating wafers. It would further have been obvious to one of ordinary skill in the art at the time the invention was made to modify '178 to provide a plate to hold the substrate as suggested by '777 with an expectation of desirable coating results, because '178 teaches spin coating where fluid is provided to a substrate to be spun and '777 teaches that when spin coating where fluid is provided to a substrate to be spun, it is known to provide a flat/plate like area to hold the substrate to be spun.

5. Claims 18-19, 25 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over '178 in view of '777 as applied to claims 14, 20, 24 and 27-28 above, and further in view of EP 595 749 A2 (hereinafter '749).

'178 in view of '777 teaches all the features of these claims except monitoring the thickness of the layer and adjusting deviations in the thickness.

However, '749 teaches that when applying liquid resist to a wafer from a spray nozzle to form a thin film on the top surface of the wafer, it is conventionally known that the resist thickness resulting from the spin coating operation is dependent on the viscosity of the resin and the spin speed. Page 2, line 55 through page 3, line 15. '749 further teaches to monitor the thickness of the applied liquid during the application and spinning process, so as to adjust to the desired thickness in situ. See page 3, lines 15-40.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify '178 in view of '777 to provide in situ measurement of coating thickness as

suggested by '749 with an expectation of better thickness control, because '178 in view of '777 teaches applying coating to a substrate to be spun with control of thickness, and '749 teaches controlling thickness using in situ measurement of coating thickness during a spin coating operation to help control the final coating results. It further would have been a matter of routine experimentation to select desired tolerances/deviations in the coating thickness (including the depth), so that it would be known when to make suggested changes based on the measurements.

Allowable Subject Matter

6. Claims 30 and 31 are allowed.

The cited prior art does not teach or suggest the bonding process of claim 30 or apparatus of claim 31 where the thickness is controlled in response to (1) a temperature of the first substrate and (2) a temperature of the second substrate and (3) at least one of a temperature of the viscous fluid and a viscosity of the viscous fluid.

Response to Arguments

7. Applicant's arguments filed Sept. 17, 2003 have been fully considered but they are not persuasive.

Applicant's Arguments

As to the rejection of claims 14, 20, 24, 27 and 28 using '178 in view o f '777, (1) applicant argues that '777 is non-analogous prior art to the claimed invention. Applicant argues that '178 is concerned with optical information medium production, including a first and second

substrates and a photopolymer resin film provided between the first and second substrates for bonding the substrates to each other by rotating the substrate integrally to make the thickness of the resin 10 substantially uniform between them. The resin thickness becomes approximately 10-60 microns. '777, on the other hand, is directed to a resist coating method for optical disks used for optical memory and a very thin layer is applied (.114 microns). The resist coating method and the very thin layer are very different from the method of bonding of '178. Applicant argues that '777 is not from the bonding field of endeavor of applicant and furthermore, is not reasonably pertinent to the problem of applicant, since applicant is concerned with the basic idea of "taking into account varying variables which influence the coating thickness or bond coating thickness during coating, in particular during bonding, and of controlling bonding in accordance with their influence" (page 9 of Remarks), and since '777is not concerned with bonding, it would not logically have commended itself to applicant's attention. (2) Even if '777 is analogous, applicant argues that it does not suggest the bonding of a first and second substrates and the combination of '178 and '777 fails to disclose or suggest the controlling of a thickness of the layer formed on the first substrate in response to a temperature of the second substrate as recited in claims 14 and 24. (3) As to the rejection of claims 18, 19, 25 and 29, applicant further argues that these claims are allowable for the reasons discussed in (1) and (2) above. Applicant further argues that '749 fails to cure the defects of '178 in view of '777 discussed above. Finally, applicant argues that '749 is also non-analogous art for the same reason '777 is non-analogous. For example, '749 merely discloses controlling the thickness of a resist on a wafer and does not disclose of suggest bonding a first and second substrate.

The Examiner's Response

The Examiner has reviewed these arguments, however, the rejections above stand. (1) As to the argument that '777 is non-analogous, the Examiner disagrees. It has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, as claimed, independent claims 14 and 24 provide for a method and apparatus that provides forming (i.e. coating) a layer on a substrate followed by a bonding process where the first substrate is bonded to a second substrate using the formed layer as a bonding material. The claims provide for "controlling a thickness of the layer formed on the first substrate" (see claim 14, for example). As the claim is worded, this controlling of the thickness can be done before the bonding process occurs. As a result, applicant is concerned with both coating and bonding processes. In fact, as stated by applicant on page 9 of the Remarks, "Applicants started out ~~form~~ from the basic idea of taking into account varying variables which influence the coating thickness ~~of~~ or bond coating thickness during coating, in particular during bonding, and of controlling bonding in accordance with their influence". As a result, it is clearly indicated that applicant is concerned with both coating and bonding processes. As a result, even through '777 is not concerned with bonding, it is concerned with variables that influence coating thickness—a concern of both applicant and the claims, and is thus reasonably pertinent to the issue of applicant. While the coating materials and thicknesses of applicant and '178 may be different than that of '777, '777 provides a teaching of how liquid coatings act during spin

coating operations and the relationship of thickness and temperature and rotational speed that would apply to other spin coating processes, such as those of applicant and '178, as well. (2) As to the argument that because '777 does not provide for bonding, the combination of '178 and '777 fails to provide controlling a thickness of the layer formed on the first substrate in response to the temperature of the second substrate as is required by claims 14 and 24, the Examiner disagrees. Claim 14 and 24 require controlling the thickness of the layer formed on the first substrate in response to "(a) at least one of a temperature of the first substrate and a temperature of the second substrate". As a result, only the temperature of the first substrate has to be considered to meet the requirements of the claims. '777 provides the suggestion to measure and consider the temperature of the first substrate, as discussed in the rejection above. (3) As to rejection of claims 18, 19, 25 and 29, the Examiner notes that as to applicant's arguments with respect to (1) and (2) they have been addressed above, and the rejection of claims 14, 20, 24 and 27-28 maintained. As to the argument that '749 is non-analogous art, the Examiner disagrees for the reasons given in (1) above. While '749 is not concerned with bonding, as discussed above, the claims and applicant are also concerned with coating processes. While the coating materials of applicant and '178 may be different than that of '749, '749 provides a teaching of how liquid coatings act during spin coating operations and the relationship of thickness and viscosity and rotational speed that would apply to other spin coating processes, such as those of applicant and '178, as well.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (703) 308-0078. The examiner can normally be reached on M-F(7:00-4:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KATHERINE A. BAREFORD
PRIMARY EXAMINER
GROUP ~~1100~~ 1700